

XVII. NOTES ON CRUSTACEA DECAPODA IN THE INDIAN MUSEUM.

XIV. ON THE OCCURRENCE OF THE CARIDEAN GENUS *DISCIAS* IN INDIAN WATERS.

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(Plate VIII).

Among a collection of Decapod Crustacea which I made during a short visit to Port Blair in the Andaman Is. in the spring of 1915, there occur five specimens of a small prawn of rather unusual interest. The marine fauna of Port Blair proved so extremely rich that, in the time at my disposal, it was not possible to examine all the forms obtained with any degree of thoroughness and the remarkable nature of the specimens was thus not noticed at the time of their capture.

The specimens prove to belong to the little known genus *Discias*, described by Miss Rathbun in 1902 from three specimens obtained by the Hopkins Stanford Galapagos Expedition at Albermarle Id. in the Galapagos group. *Discias* shows little affinity with any other genus of Caridea and Miss Rathbun referred it to a new family, the Discidae, which hitherto has been known only from her original description. It is not a little remarkable that the genus should reappear in Indian waters, for the Andamans are separated from the Galapagos Is. by almost exactly half the circumference of the globe.

In the family Discidae, or, as I would prefer to call it, the Disciadidae, we find characters which appear to be primitive combined with others which indicate a high degree of specialization. The persistence of exopods on all five pairs of legs would seem to be a very primitive feature and the second maxillipeds are also less highly organized than in most Caridea. On the other hand the mandibles and maxillae are not primitive and the legs of the first pair, in the extreme reduction of the carpus and in the remarkable structure of the fingers, present characters which are without parallel in the Macrura and afford clear evidence of specialization.

Miss Rathbun considers that the family is related to the Atyidae and Hoplophoridae but, except for the exopods on the legs, I can find little to recommend this view. The molar and incisor processes of the mandible are separated in *Discias* by a deep cleft and the proximal endite of the maxilla is reduced.

In both these features the family differs from the Atyidae and Hoplophoridae and resembles more specialized forms which do not possess exopods.

The families of Caridea in which exopods exist on two or more pairs of peraeopods do not, for the most part, show any very close agreement with one another in other respects, and this fact points to the conclusion that exopods persisted among ancestral forms while considerable modifications in other directions were effected.

The possibility that exopods in some instances may actually have reappeared cannot be dismissed as altogether improbable. They are of frequent occurrence in the larvae of Caridean families that do not possess them when adult, and it is not difficult to imagine that their occasional reappearance might be caused by a persistence of larval characters into the adult stage.

The presence of a series of exopods on the legs is thus by itself insufficient to determine true relationship among the Caridea and it appears probable that better indications of affinity are afforded by the structure of the mouth-parts, especially of the mandible and maxilla. In the latter characters *Discias* shows a marked resemblance to the Hippolytidae and Palaemonidae and, notwithstanding the differences in the first two pairs of peraeopods, it is in these families, I believe, that the Disciadidae find their nearest surviving allies. *Discias* is without doubt the most specialized Caridean genus that possesses a full series of exopods.

The species obtained in the Andamans is distinguished from that found in the Galapagos Is. by characters which are clearly not more than specific. Miss Rathbun's specimens were all females; in the collection from the Andamans both males and females occur, the former differing from the latter only in the normal modifications of the first two pairs of pleopods.

The specimens were all found together on a yellow sponge. In the absence of precise field observations it is not possible to say whether the association was fortuitous or whether the prawn and sponge are synoecious, though the remarkable chelae of the prawn suggest that it must have some peculiar mode of life.

Family DISCIADIDAE.

1902. Discidae, Rathbun, *Proc. Washington Acad. Sci.*, IV, p. 289.

Genus *Discias*, Rathbun.

1902. *Discias*, Rathbun, *l.c.*, p. 290.

Discias exul, sp. nov.

Plate VIII.

In general appearance the species bears some resemblance to small Pasiphaeids belonging to the genus *Leptochela*, but is immediately distinguished by the remarkable character of the first two pairs of legs.

The rostrum consists of a horizontal triangular plate, rather strongly depressed and reaching almost to the end of the second segment of the antennular peduncle. In dorsal view it is nearly twice as long as its basal breadth. It bears a blunt median ridge, not continued backwards on to the carapace, with a shallow groove on either side. Near the base the lateral margin is reflected upwards and in the distal two-thirds of its length it bears a series of minute teeth or serrations, some 10 to 15 in number.

The carapace is smooth and rounded; its breadth is about equal to its height and about two-thirds its length. The anterior



TEXT-FIG. 1.—*Discias exul*, sp. nov.

a. Antennal scale.

b. Mandible.

c. Maxillula.

d. Maxilla.

e. First maxilliped.

f. Second maxilliped.

g. Third maxilliped.

h. Barbed spinule at end of ante-penultimate segment of third maxilliped.

border on either side of the rostrum is occupied mainly by the very large semicircular orbit which is defined below by a strong antennal spine. The antero-lateral angles are broadly rounded.

The eyes are very large and nearly globular; the breadth of the hemispherical cornea is greater than the length of the stalk. The black ocular spot, found near the cornea in many Caridea, is not visible.

The antennular peduncle reaches almost to the end of the antennal scale and is stout, with a lanceolate lateral process which reaches a little beyond the middle point of the basal segment. The outer margin of this segment is not provided with a distal

spine; it is, however, somewhat produced and carries a few long setae. The second segment is broader than long and a little shorter than the third. The outer flagellum is thickened at the base where, on its outer side, it bears tufts of long setae. The flagella seem to have been broken at the tips, but both were certainly longer than the peduncle.

The basal segment of the antenna does not possess an external spine. The antennal scale (text-fig. 1a) is oval with convex inner and outer margins and with a blunt apex; it is about three times as long as wide. The outer margin is not thickened in the usual fashion and does not end in a spine. The midrib described by Miss Rathbun is not evident, though there is a slight median swelling due to the presence of the longitudinal muscle. The basal segment of the flagellum reaches almost to the middle of the scale. The flagellum itself is long, extending to the end of the fourth abdominal somite when reflected backwards.

The mandible (text-fig. 1b) is deeply cleft into two processes. The anterior or incisor process is pointed, not apically truncate as in Miss Rathbun's figure of the allied species. The posterior or molar process does not possess the grinding surface found in most Caridea, but is narrow and acute with a series of sharp teeth that extend backwards in a single row on the inner side. The mandibular palp is composed of two segments, the distal scarcely half the length of the proximal and bearing a single long feathered seta at the apex.

The proximal endite of the maxillula (text-fig. 1c) is broad-ended and the palp bears two long setae behind the apex. In the maxilla (text-fig. 1d) the proximal endite is greatly reduced and does not reach nearly to the level of the two lobes of the distal endite. The first maxilliped (text-fig. 1e) bears a bilobed epipod. The second maxilliped (text-fig. 1f) has a bilobed epipod and the exopod reaches beyond the end of the merus. The endopod is slender; the basis and ischium are fused, the merus long and narrow and the carpus very short; the dactylus is attached obliquely to the end of the propodus.

The third maxilliped (text-fig. 1g)¹ reaches almost to the end of the antennular peduncle. There is a small epipod (not shown in the figure) and the exopod reaches to the end of the antepenultimate segment. At the end of this segment on the inner side there is a small stout spinule with three barbs on its inner aspect (text-fig. 1h). The penultimate segment is a little more than two-fifths the length of the antepenultimate. The terminal segment is spatulate in form and one and three quarter times the length of the penultimate; it has transverse rows of plumose setae on its surface and spinules on its margins.

The first peraeopod (text-fig. 3a) does not reach quite as far forwards as the third maxilliped. The exopod extends beyond

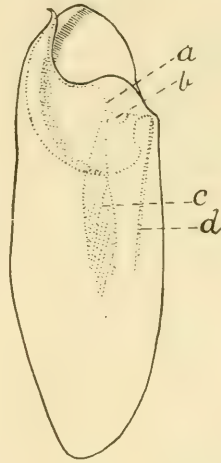
¹ The exopod in this figure is displaced to the left, the outer edge of the endopod being on the right.

the end of the merus. The basis and ischium appear to be fused. The merus is widest at its distal end and is about twice as long as its greatest breadth; on the inner side the distal margin is deeply hollowed to receive the hinder end of the chela, which projects backwards beyond the carpus. The carpus is exceedingly small and inconspicuous, consisting merely of a thin plate, oval when seen from below, lying between the merus and the chela. The chela itself is thick and heavy, less than three times as long as broad and fully one and a half times as long as the merus. As noted above, the posterior end of the chela, when the limb is straightened, fits into a cavity in the distal end of the merus. The structure of the fingers is difficult to make out satisfactorily. When seen from

below the chela presents the appearance shown in text-fig. 3*b*. Text-fig. 2 is a dorsal view of a chela which has been cleared in Eau de Javelle. The dactylus is a thin plate or disc, more or less circular in outline which, when it is closed, is ensheathed by more than half its total extent within the propodus. The dactylus is not flat, but saucer-shaped, and the cutting edge is semicircular, at the actual margin thin and transparent and with a band of closely-set striae parallel with the edge.

The second pereiopod (text-fig. 3*c*) reaches to the middle of the propodus of the first pair, with exopod extending beyond the end of the merus. The basis and ischium are fused, the merus is little more than three times as long as broad and the carpus is very short and more or less quadrate in outline. The chela is about three quarters the length of the merus and the dactylus about half the length of the palm. On the outer side of the fixed finger there are two long spines. There are two or three small spinules on the cutting edge of the dactylus and one in a similar position on the fixed finger. At the tip each finger bears three or four long, curved, interlocking spines (text-fig. 3*d*).

The last three pairs of pereiopods decrease successively in length; the third (text-fig. 3*e*) reach about to the end of the antennal scale, the fifth (text-fig. 3*f*) scarcely to the distal end of the merus of the first pair. The exopod in the third pair reaches a little beyond the middle of the merus, in the fifth pair to the end of

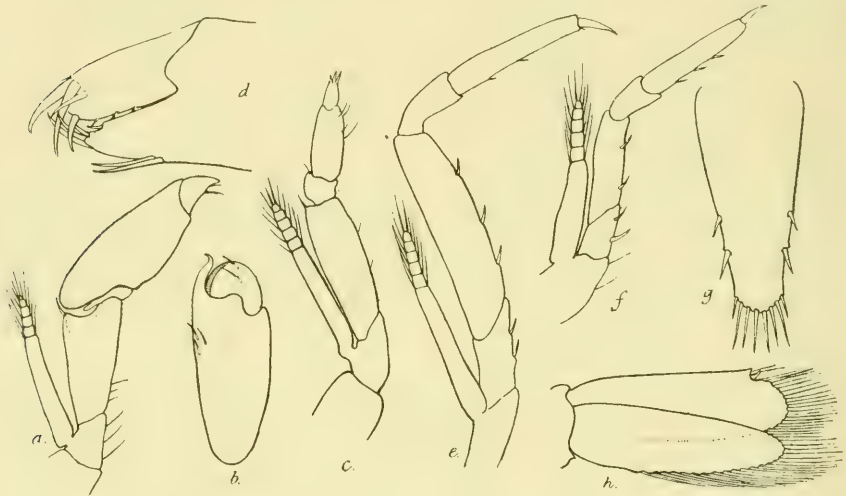


TEXT-FIG. 2.—*Discias exul*, sp. nov.
Chela of 1st pereiopod in dorsal view.
a. Distal end of palm on lower side of chela.
b. Axis on which dactylus rotates.
c. Protractor muscle.
d. Retractor muscle.

the merus. There are large spines on the inferior margins of the ischium, merus and propodus, usually two on the ischium and two, three or four on the merus and propodus. The propodus is about twice the length of the carpus and three and a quarter to nearly four times the length of the dactylus, which is simple and sharp-pointed.

There are no epipods on the legs. The series of gills consists of five pleurobranchs, one situated above each peraeopod.

The abdominal somites are smooth and dorsally rounded; measured dorsally, the sixth is about one quarter longer than the fifth. In the male the endopod of the first pair of pleopods is oblong in shape with four long setae at its distal end. The



TEXT-FIG. 3.—*Discias exul*, sp. nov.

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|--|---------------------|
| a. First peraeopod. | e. Third peraeopod. |
| b. Chela of first peraeopod, from below. | f. Fifth peraeopod. |
| c. Second peraeopod. | g. Telson. |
| d. Fingers of second peraeopod. | h. Uropods. |

remaining pairs of pleopods are provided with an appendix interna and, in the male, there is an appendix masculina on the second pair.

The telson (text-fig. 3g) is rather broad. It bears two pairs of dorsal spinules, both situated in the distal half of its length. At the apex it is armed with four pairs of slender spines; of these the outermost are the shortest and the next pair the longest. The variation noticed by Miss Rathbun in the number of terminal spines does not seem to occur in this species. The outer uropod (text-fig. 3h) is about three and a half times as long as wide; the outer margin terminates in two short spines, the inner of which is movable.

The largest specimen is only $7\frac{1}{2}$ mm. in total length. The eggs are large for so small an animal; they are rather shrunken

in the single ovigerous female, but appear to have been about 0·85 by 0·7 mm. in longer and shorter diameter. In life the specimens were colourless and semitransparent ; the eggs borne by the female were green.

Discias exul differs from Miss Rathbun's *D. serrifer* in a number of particulars. *D. serrifer* is a much larger species, 15 mm. in length, with a punctate carapace and with the antennal scale projecting further beyond the end of the antennular peduncle. The palmar portion of the chela of the first peraeopods is less than twice as long as broad in *D. serrifer*, but more than twice in *D. exul* and whereas the postero-inferior angles of the fifth and sixth abdominal pleura are rounded in the latter species, they are subacute in the former. In the tail-fan there are striking differences. The telson bears ten or twelve terminal spines in *D. serrifer* and there is a series of ten to twelve teeth on the external margin of the outer uropod ; in *D. exul* there are only eight spines at the apex of the telson and the margin of the outer uropod is unarmed.

The five specimens of *D. exul* were found on a yellow sponge ; they were obtained at low water on March 1st, 1915, at Port Blair in the Andaman Is., on the reef at the N. end of Ross I.

EXPLANATION OF PLATE VIII.

Discias exul, sp. nov.

Ovigerous female in lateral view.



DISCIAS EXUL SP. NOV.